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Steeped strip foundation



Fig1. Steeped foundation for strip Source: - civil engineering cyber Compilation:-@etconp

INTRODUCTION

Foundation provide support for structures and transfer their load to the layers of soil or rock that having sufficient bearing capacity and suitable settlement charateristics.

- ✓ መሰረት (foundation) ለሚሰራው ህንፃ ወይም ድልድይ ድጋፍ የሚሰጥ የመዋቅር ክፍል ነው። የህንፃ መሰረት ከላይ የሚመጣውን ክብደት በመቀበል ወደመሬት ያስተላልፋል።
- ✓ ሁል ጊዜም የህንፃ መሰረት መገንባት ያለበት የአፈር የመሸከም አቅሙ ለህንፃው በቂ በሆነበት ቦታ ነው ወይም የአፈር የመሸከም አቅሙን እና engineering property of soil የተለያዩ መንገዶች ማሻሻል እንችላለን።
  - ❖ ለምሳሌ የ ጥቁር አፈር የመሸከም አቅሙ ጥሩ ሚባል ነው ነገር ግን ውሃ ሲያገኝ expand ያደርጋል (volume ይጨምራል) እና ውሃ ሲያጣ ይሸማቃል (contract) ይህም በህንፃው ላይ ጉዳት ያደርሳል።

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- ✓ በሚነፋበት (expand) እና በሚሸማቅበት (contract) ጊዜ ከ መሬት ጋር ቀጥተኛ ግንኙነት ያለውን ወለል ይሰነጠቃል (Ground support slab which has contact with the surface will crack) ይህ እንዳይሆን አፈሩን በደንብ መጠቅጠቅ (compact) አለበት።
- ✓ አፈር እየቆፈርን ወደታች ስንሄድ የአፈር የመሸከም አቅሙ እየጨመረ ይሄዳል በደንብ ወደታች እየቆፈርን ስንሄድ bed rock እናገኛለን።



Figure2. Soil layers source: - topper

STEEPED FOOTING

Strip foundation (or strip footing) are types of shallow foundation used to provide a continuous, level (or sometimes steeped) strip of support to linear structure such as wall or closely-spaced rows of columns built centerally above them.

Where the natural surface of ground is sloped the most economical may be stepped foundation.

In this case, the foundation takes the form of a series concrete horizontal steps following the slope of the ground.

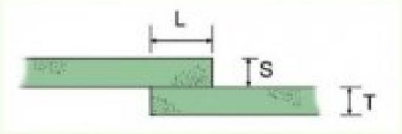
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Stepped strip foundation

On sloping sites it is usual to step the foundation to follow the line of the ground and therefore reduce the amount of excavation required.

When constructing stepped foundations, the construction starts at the lowest level of the site.



Building regulations relating to stepped foundations states:

The minimum overlap L should be equal to twice the height of the step S or the foundation thickness T or a width of 300mm whichever is the greatest.

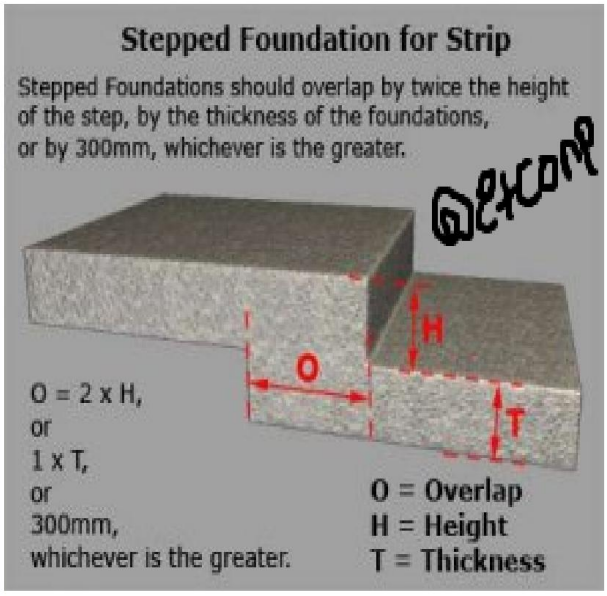


Figure3. Source:-foundation specialists

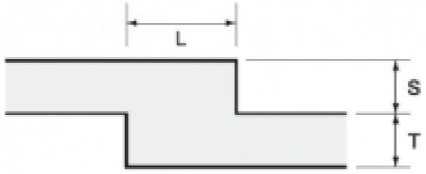
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Diagram 21 Elevation of stepped foundation

See paras 2E2d and e

Foundations should unite at each change in level



Minimum overlap L = twice height of step, or thickness of foundation or 300mm, whichever is greater

S should not be greater than T

(For trench fill foundations, minimum overlap L = twice height of step, or 1m, whichever is greater)

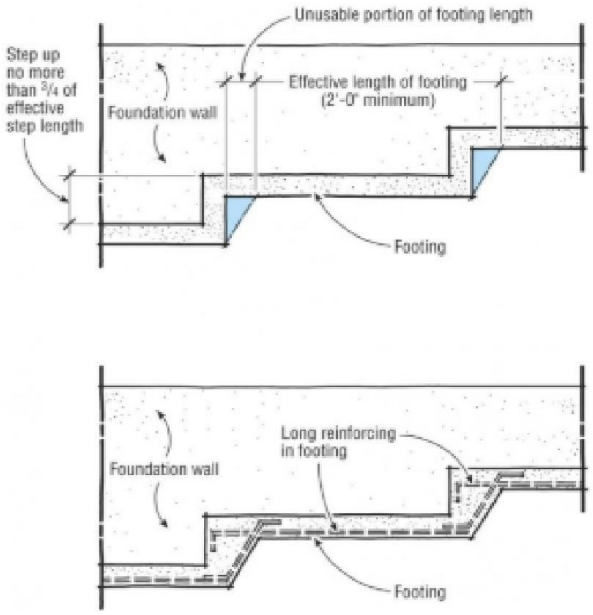
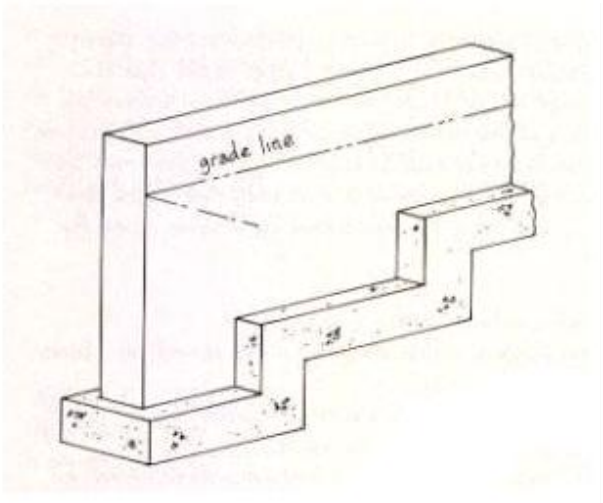


Figure4.elevation of stepped foundation Source: - topper

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This helps to minimize the amount of excvatation and below ground wall construction that would otherwise be required. Steeped foundation can also be used to transition from deep foundation to shallow foundations, and at the corners and intersections. Regularly steeping foundations also avoids abrupt and excessive changes in level that could cause a weakness resulting in movement. Similarly, abrupt and execcisve changes in foundation depths should be avoided at corners and intersections by the introduction of steeping.



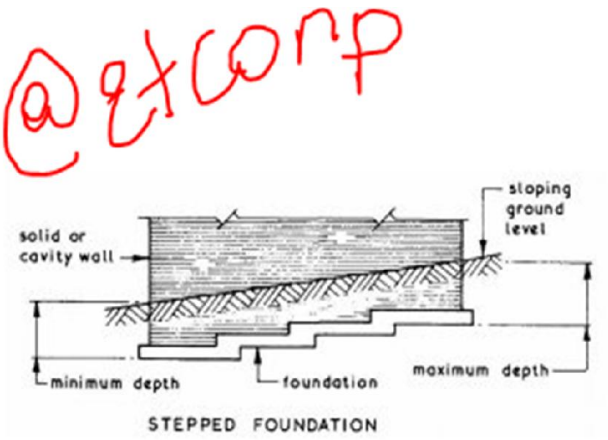
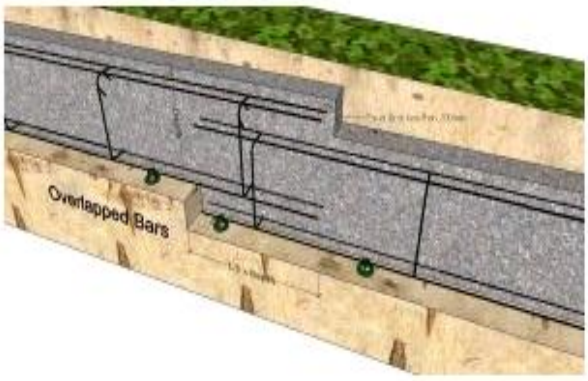


Figure5.3D of steeped footing Source:-topper

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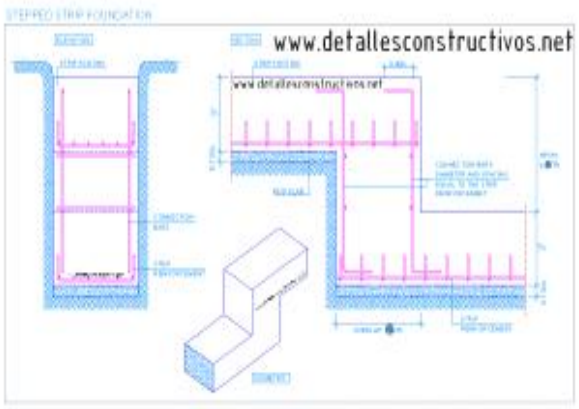


Figure6.overlap bars of steeped footing Source:-topper

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Each step in foundation should be no higher than thickness of the foundation. The foundation at higer level shoud also overlap the lower foundation, typically by atleat twice the height of the step, or by the thickness of the foundation, or by atleast 300milimeters (whichever is greatest). Drainage must be carefully designed to eliminate the danger of instability due to accumulating water pressure.

የ እያንዳንዱ ደረጃ thickness ከfoundation'ሁ thickness መብለጥ የለበትም። የእያንዳንዱ የደረጃ ብረት ቀጣይ ካለው ብረት (reinforcement bar) ጋር መያያዝ አለበት። ይህም ማለት ላይ ያለው ቀጣይ እታች ካለው ጋር መያያዝ አለበት።

ይህን Foundation በምንሰራበት ጊዜ የብረት overlap በተለምዶ የደረጃውን ሁለት እጥፍ መሆን ያለበት ወይም የደረጃውን ከፈታ እኩል ወይም ደግሞ 300 ሚሊሜትር (ከነዚህ ከ3ቱ የበለጠው overlap length of bar for the steeps ተብሎ ይወሰዳል) ። ልክ ለ column 40d (40 times diameter of the bar) ብለን እንደምንወስደው።

የ Drainage ስራ ስንሰራ የተጠራቀመ የውሃ ግፊት (water pressure and pore water pressure) በከፋ ጉዳት እንዳያደርስ at design stage ቆም ብለን ማሰብ ይኖርብናል።

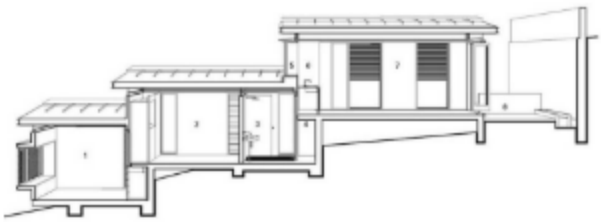


Figure7. house made of Steeped footing source: - topper

Source: - topper

Foundation specialists

Prepared by: -@etconp